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An
Inaugural Dissertation.
on
Tetanus.
Submitted to the examination
of the

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On Tetanus.

Tetanus, this is a painful disease, and its frequent mortality; called the attention of the earliest physcians. In the ancients works, we find it discribed, with some accuracy by Hippocrates; who, supposed wound to be the most general cause.

Since his time, we find it discribed by various authors, who divide it into several species, by which they mean to distinguish, the different stages of the same disease; and have allotted a name, to each grade of this disease, expressive of the different position of which the body is liable to be thrown into; by the contraction of certain muscels; which positions are known by the following names. viz Tetanos, Emprosthonos, Opisthotonos, Pleurosthotanos. &c. The whole of these terms mearly express the same disease.

All late writers concur in opinion that tetanus changes with paroxisms; sometimes affecting one part of the body with violent contractions and rigidity of the muscels on the back; then again at ~~that~~ short intervals, the opposite muscels are contracted. With those alternate remissions & intermissions, the same person may be said to have tetanus, Opisthotonos, Emprosthotonos. All in the space of a short time.

Mosely relates 2 interesting cases which corroborates this opinion.

Cases 1.st Once, as I entered the hut of a negro belonging to Mr Thos Bond, in Kington in Jamaica, the man had got up in one of the remissions, in an opisthotonus, & was standing on the floor, leaning against his bed. On my speaking to him, he was suddenly seized with violent contractions of all the muscels, which curved him like a bow, & sprang up from the ground and ~~pitch~~ pitched

backward, with his head foremost nearly three yards from the place where he stood, amongst some earthen pots that were in the corner of his hut. By the fall he cut his head very much, & divided the temporal artery. He died within two hours.

Case 2d In which every part of a womans body was convulsed, or rendered stiff & rigid by turns. Sometimes her head was turned to the right side, then to the left, then backward as in the opisthotonus, then forwards as in the Emprosthotonus.?

This disease may and does occasionally, occur in every climate that we are acquainted with. Yet it occurs most frequent in the Tropical climates, and most commonly, in the warmest seasons of such climates: So much so indeed; that it has been considered endemical in such climates. Hillary Observes ~~that~~ the arthristick, suffered pretty much in a dry cool season; and several persons were seized with opisthotonos & tetany from seemingly very slight causes. x

x Hillary page 88.

"Mosely likewise remarks tetanus, is endemical amongs children in many places between the tropices; but by no means, as some have supposed, depending on situations near the sea, or exposed to the winds; when it attack them, it is generally on or the eight or ninth, and seldom after the twelfth or ~~fourteen~~ fourteenth day, from their birth"[8]

"Though the causes do, upon occasion, effect all sorts of persons, they seem however, to attack persons of Middle age more frequent than the older or younger, the male sex more frequent than the females, the robust & vigorous more frequent than the weaker"[7]

Mosely remarks the negroes, are more subject to tetanus than the whites. This he supposes, is owing to an increase of irritability & diminished sensibility. He likewise observes the algerines & moroccans, are much distinguished for privation of sensibility as the negroes.

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[8] Mosely page 528. [7] Cullen page 395

Here, I cannot agree with the illustrious Mosely; that this increase irritability, and diminished sensibility is natural, but may be acquired from certain causes. Which I shall briefly enumerate. We have many instances of Debility destroying pain - hence, criminals can bear the greatest punishments inflicted with fortitude; of this we have a striking instance, a case mentioned Dr Priestly; a man who was sentence for some crime to suffer punishment at stated periods. He bore it with uncommon fortitude, and almost without a groan. Being asked how he borne it, he answered he always fastened 2 or 3 days before his punishment came on.* Again; Do we not see delicate females? who from disease have not taken much nurishment, bear operations of the most painful kind with composure; and scarcely utering a groan. Further, Bleeding so much recommended in parturition to relax the rigidity of the ostium,

* Dr Rush's Lect.

and the adjacent parts; from its debilitating agency, also allivates pain. Lastly; do we not always give Laudanum before performing a painful operation? this I suppose, is given with a view to paliate pain, which its does by produ=-cing indirect debility.

May not the sparing diet, in addition to heat, labour, fatigue &c. to which the negroes are gen=-nerely confined to, bring on debility? which I have mentioned; Dystroys sensibility in a great measure and consequently, the irritability will accumu=-late in equil ratio, to the diminution of sensibil=-ity. To this I attribute their fortitude under painful operations; and not to the natural irritability as Mosely supposes; but to their preter=-natural irritability. These causes I conceive are sufficient explanation; why! the negroes are more subject to this disease than the whites. Why from better circumstances, are not exposed to many of the above causes.

Symptoms.

When this disease is brought on from cold, it generally makes its appearance; a few days after the applications of such colds. But when arising from punctures or lasions of the Nerves, muscels, or tendons, it does not appear so soon. Frequently not untill after the tenth day; but there are instances, in which 6 or 8 weaks have elapsed, after the last related exciting cause. Often do we see tetanus come on from wounds, where the patent is doing to all apperance well the wound healing kindly; the pain much deminished in the part; and the general health of the patient good. When suddenly an accute pain, extending up the limbs when from wounds of the arms or legs, to the neck, back, & frequently to the root of the tongue which pain is succeded by spasm of the muscels of those parts, constituting whote is called tetanus.

"The disease sometimes comes on suddenly to a volent degree, but more generally it ~~approaching~~ approaches by slow degrees to its violent state. In this case it comes on with a sense of stiffness in the back part of the neck, which gradually increasing, renders the motions of the head difficult & painful. As the rigidity of the neck comes on increasing, there is commonly at the same time a sense of uneasiness felt about the root of the tongue, which by degrees becomes difficulty of swallowing, and at length an entire interuption of it. While the rigidity of the neck goes on increasing, there arises a pain, often violent at the lower end of the sternum, and from thence shooting into the back. When this pain arises, all the muscles of the neck, and particularly those of the back part of it, are immediately affected with spasm, pulling the head strongly backwards. At the same time, the muscles that pull up the lower jaw, which upon the first approaches of the the disease were affected with some spastic rigidity,"

"are now generally affected with more violent spasm; and sets the teeth so closely together that they do not admit of the smolest opening. When the disease has advanced thus far, the pain at the bottom of the sternum returns very frequently; and with it the spasms of the hind neck & lower jaw, are renewed with violence & much pain. As the disease thus proceeds, a greater number of muscles comes to be affected with spasms. After those of the neck, those along the whole of the spine becomes affected, bending the trunk of the body. During the whole of the disease, the abdominal muscles are violently affected with spasm, so the belly is strongly retracted, and feels hard like a board. At length the flexors of the head & trunk becomes so strongly affected as to balance the extensors, and to keep the head & trunk straight, & rigidly extended, incapable of being moved in any way; and it is to this state the term of tetanus has been strictly applied."

"At the height of the disease, every organ of voluntary motion seems to be affected; & amongst the rest, the muscles of the face. The forehead is drawn up into furrows, the eyes, sometimes distorted, are commonly rigid, & immoveable in their sockets; the nose is drawn up, and the whole countenance expresses the most violent grinning. Under these universal spasms a violent convulsion commonly comes on, and puts an end to life". — "These spasms are every where attended with most violent pains. The utmost violence of spasm is however, not constant; but, after subsisting for a minute or two, the muscles admit of some remission of their contraction, altho' of no such relaxation as can allow the action of their antagonists.

"This remission of contraction gives also some remission of pain; but neither is of long duration. From time to time, the violent contractions & pains are renewed sometimes every ten or fifteen minutes, and that often without any evident exciting cause. But such exciting causes frequently occur, for almost every attempt of

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"motion, as attempting a change of posture, endeavoring to swallow, & even to speak, sometimes gives occasions to a renewal of the spasms over the whole body."

"Although fever be not a constant attendant of this disease, especially when arising from lesions of nerves; yet in those cases, ~~producing~~ proceeding from cold, a fever sometimes has supervened, and is said to have been attended with inflammatory symptoms."

"Blood has been often drawn in this disease, but never exhibited any inflammatory crust; and all accounts seem to agree that blood drawn seems to be of a looser texture than ordinary, and that it does not coagulates in the usual manner.

"In this disease the head is seldom affected with delirium, or even confusion of thought, till the last stage of it, when, by the repeated shocks of a violent distemper, every function of the system is greatly disordered."

"Tetanus often proves fatal befor the fourth day; and when a patient has passed this period, he may be supposed to be in greater safety, & in general the disease

is the safer the longer it has continued: It is however, to be particulary observed, that even for many days after the fourth, the disease continues to be dangerous; & even after some considerable abatement of its force, it is ready to recur again with its former vio=-ence & danger, It never admits of any sudden, or what is called critical solution; but always recedes by degrees only, & it is often very long before the whole of the symptoms disappear" *

Predisposing causes.

These are all such as induce debility either directly, or indirectly particularly of the muscels.

1. Cold, this has long been considered, as an active agent in producing debility.

2. Debilitating passions of fear, Grief, & dispair.

3. Want of sufficient aliment. All these act, directly in inducing this debility.

4. Heat, this is universally acknowledge, to be the predisposing

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* From Cullens practice.

cause of tetanus. Hence the frequency of it in the tropical climates.

5. Unusual labour and exercise: hence we find tetanus more frequent occuring; from wounds received in battle, than at any other time.

To these causes may be added excess in venery, and indeed every thing which tends to induce debility.

From what has already been said, I infer that debility from abstraction or action, constitutes the predisposition of this disease. However, this Debility does not appear to be universal, but is more particularly seated in the muscles, which may be inferred from their being almost exclusively the seats of the disease, for were debility equal in every part of the the body, we would have universal disease; as many of the occasional causes of tetanus, are such as frequently inducing fever when preceded this requisite predisposition.

Of the exciting causes.

The partial division of a nerve or tendon, was believed by the ancients, to be the most frequent cause of this disease. But since those times experience & observation has taught us that superficial wounds, on any part of the body; may excite the disease.

Cold, this in some instances has been known to be the exciting cause of this disease, more especially after exposure to intense heat. Of this Dr Girdlestone mentions many instances. — Dr Chalmer relates an instance of its having been induced by a person's sleeping without a night cap after shaving his head. The cool air more certainly brings on this disease, if applied to the body in the form of a current.+

Certain poisonous vegetables. There are several cases upon record of its being induced by hemlock dropwort and the datura stramonium (*)

Lastly certain emotions and passions of the mind." "Terror brought it on a

+ Stark work vol 1 page 252 (*) Rush & Barton Lect. —

brewer in the city. He had been previously debilitated by great labour, in warm weather. I have heard of its having been induced in a man, by agitation of mind, occasioned by seeing a girl treat upon a nail. Fear excited it in a soldier who kneeled down to be shot. upon being pardoned he was unable to rise, from a sudden attack of tetanus"*

Of The pathology.

From the symptoms and many of the causes, am naturally led to suppose the disease to exist in the muscels, but in what manner the causes act appears difficult to ascertain. Mosely seems to suppose that it is a spasm seated onely in the muscels or subservient to the animal functions. And this whither original ~~original~~, or symptomatical; "is caused by irritation ~~impressions~~, which depending alike upon irritating impressions, made upon any one part of the body, producing morbid excitement,

* Hunt work vol 3 page 253. 255

or disease in another. It is immaterial whether the impression be made upon the intestines by worms, upon the ears by ungreatful noise, upon the mind by a strong emotion, or upon the sole of the foot by a nail; it is alike communicated to the muscles, which from their previous debility & irritability are thrown into commotion by it. In yeilding to the impressions of irritants, they follow their contractions the ~~order~~ order of their predisposing debility. The muscles which move the lower jaw are affected more early, and more obstinately than any of the other external muscles of the body, onely because they are more constantly in a relaxed or idle state.[1]

Prophylaxis.

Few diseases, which can with more certainly be prevented, in its forming state than tetanus; and to this period we should be particular attentive.

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[1] Mitchell work Vol 3 page 254

Thus from all its causes, has nearly the same premonitory symptoms. These are stiffness, in neck, a disposition to bend forward, in order to relieve a pain in the back, costiveness, a pain ~~in the back~~ about the region of the stomach, & a disposition to start in sleep. In this feble state of the disease, an emetic, a strong dose of laud-anum, the warm bath, or a few doses of Bark, have often prevented it being completely formed. When it has arisen from a wound, dila-ting it if small or healed, and afterward inflam-ming it, by applying to it turpentine com-mon salt, corrosive sublimate, or spanish flies, have in many hundred instances been attended with salutary effects[1]

Cure.

The indications of cure are s to lessen or obstruct the morbid excitement of the muscels, which may be

[1] Hunt work Vol 1 pag 256

accomplish 1 by Bloodletting, 2 Emetics. & 3 purgatives.
& 2d after sufficient depletion to remove or overcome
the disease by tonics remedies. These are 1 Opium,
2 Bark. 3 wine. 4 oil of Amber. 5 Cold & hot baths, & mercy
each of which I shall briefly mention. — — — —

Bloodletting I find, has been mentioned as early
as Hippocrates, & has been found very beneficial
in tetanus, arising from cold; which according
to Hillerys observation, are generally attended with
phlogistic Diathesis. It likewise has been found
useful when arising from wounds attended with
inflammatory symptoms.

Emetics & Cathartics.

These have been employed in some cases with
success; Especially. "When the disease is the effect
of fever, the same remedies should be given as
are employed in the cure of that fever. I have once
unlocked the jaw of a woman, who was seized at
the same time with a remitting fever by emetic"

They also prove ~~serviceable~~ serviceable, where acrid substances or poisions are taken into the stomach. Purges may be used with a view to evacuate the alimentary canal, thereby expelling the acrid faces and sometimes worms which cause irritation. — — Opium. — — — —

According to Dr Holmes opium is universally necessary; and it must be given with a bold hand, and at short intervals of time between the doses; untill the end is answered. Mosely observes it has been given to the extent of one draemk every three or two hours, together for several days without inducing sleep. But alas, in those large doses, do we often find it ineffectual in removing this disease.

Bark and Wine.

Dr Rush mentions one case, in which the opium had failed in large and repeted doses, when it was immediately dismissed; and gave large quantities

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* Dr Holmes on Disease of South Carolina page 28

of bark and wine, to the amount of two or three ounces of the former, and from a bottle to three pints of the latter in a day; in a few hours I was delighted with their effect: His spasms & pains were less frequent & violent, & he slept for several hours, which he had not done for several days and nights before. With the same indication in view, I applied a blister between his shoulders, and rub=bed in two or three ounces of mercurial ointment upon the outside of his throat. He continued to mend gradually under the operation of these medicines, so that in ten days he was out of dan=ger. Altho the spasm continued in his wounded foot for several weeks afterward*

Ardent spirits.

A quack in New England has totally cured tetanus, by giving it in such large quantities as to produce intoxication +

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* Med Memoirs. + memoirs of the Med. Society of London cap. Thirst + Dict work vol 1 page 180

Oil of Amber.

This from its action on the muscular system is much recommended by many auther in the cure of tetanus; and should be given in considerable doses and repeted.

Cold bath.

This has in many instances performed cures; we find it mentioned by Hippocrates, and since his time is recommended by many authers. In one of two cases, in which I have used it with success, the ~~th~~ patient's jaw opened in a few minutes after the effusion of a single bucket upon her body ⇒.

Warm bath.

This has often been used with success, Mosely cured a Captain Thompson of a tetanus, only by putting him into a warm bath, three times a day; and given him small doses of laudan-

⇒ Mark work vol 1 page 260

-um & antimonial wine. This medicine kept up a great perspiration, caused by the bath; which I judged to be the most proper method of treating a tetanus as his was from obstructed perspiration, from the night air. &

Mercury.

This has been employed with a view to salivate by many practitioners; and when this could be accomplish, the disease generally terminated favorable. Dr Young mentions a case, which he cured by means of this medicine, after opium wine, Bark, & oil of amber had failed. & Dr Rush also said he saw a case which was cured in the hospital by this medicine. But unfortunately the Ptyalism cannot be generaly excited early enough to be of service.

Seatons.

Have ~~been~~ often been used with advantage. Desportes says, he cured a negro woman, by making a seaton

& Mosely on tropical ~~climates~~ Diseases page 503

Dr Benton Med & Phys Journal Vol

in her neck, with an hot needle.

Blisters.

"Dr Girdlestone commend Blisters in high terms in this disease. He says he never saw it prove fatal, even where they only produced a redness on the skin".x

x Ettenbs work Vol 1 – page 262